Unraveling the impact of public debt on economic dynamics in Southeast Asia: A vector analysis perspective

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Abstract.
This research employs a panel vector model to analyze panel data, examining the relationship between public debt, economic growth, interest rates, consumption, and net exports in Southeast Asia from 1990 to 2020. This quantitative study focuses on vector analysis using secondary data from the World Bank for the specified period. The findings reveal that public or state debt significantly inhibits most economic variables, suggesting a detrimental impact on Southeast Asia. A notable observation is the effect of rising interest rates on net exports, highlighting how increased rates hinder the exports of ASEAN member countries. Contrary to expectations, the analysis indicates that government spending escalates public debt. Furthermore, Southeast Asian consumption appears to bolster exports through international trade agreements. Interestingly, exports are found to increase government spending, implying a contribution to state revenues. A key finding is that economic growth, marked by GDP increases, positively influences all variables in this study, signifying that GDP growth spurs both the monetary and real sectors of the Southeast Asian economy.

Keywords: *Economic performance; Public debt; Southeast Asian Region; Vector analysis*

JEL Classification: F34, O11, C33

INTRODUCTION

This study commences by examining the contribution of fundamental production factors to economic growth, expanding the analysis to include the impact of human capital (Widarni & Bawono, 2020; Wilantari, 2021). It further delves into the determinants of productivity, emphasizing the significance of technological and institutional (political and economic) innovations as pivotal variables influencing productivity and growth (Rusmingsih et al., 2021; Harnani & Braun, 2022).

The exploration of growth dynamics and the influence of direct factors on economic variables is conducted through a mathematical model grounded in neoclassical economic theory (Wilantari & Priyanto, 2021). This model interrogates

how fundamental factors affect direct factors and their impact on economic growth. Despite the extensive variables analyzed, the critical role of a country's external and internal public debt is often overlooked. This financial constraint on growth is typically considered an inevitable challenge, lacking politically feasible solutions, and is occasionally mentioned only to argue against its significant impediment to growth (Sun et al. 2020).

Excessive debt emerges as a crucial explanatory variable in financial crises, exacerbating debt levels and adversely affecting growth, perpetuating a cycle of escalating debt and diminishing growth (Kuzucu & Kuzucu, 2019). This phenomenon is evident in the financial crises experienced by Latin American countries and other global regions, where various forms of debt have played a central role (Khalid et al. 2020). Notable examples include the 1982 Mexican financial crisis triggered by excessive foreign debt (Alvarez, 2021) and the debt crises in the USA (2008) and Europe (2013) (Bawono et al., 2018).

Formulating strategies to mitigate debt levels and foster economic growth presents a multifaceted challenge (Chugunov & Makohon, 2019). Effective financial and economic policy-making to manage rising public debt and stimulate growth requires a delicate balance. This entails implementing comprehensive fiscal reforms and astute credit policies, aligning deficit and debt reduction strategies with the pursuit of sustainable growth (Asteriou et al. 2021).

To effectively integrate public debt into the discourse on economic growth, poverty, and national wealth, it's imperative to comprehend its multifaceted global dimensions (Ferrannini, Barbieri, Biggeri, & Di Tommaso, 2021). The debt burden, particularly in developed countries, poses a significant global threat, with the interplay of debt dynamics and state fiscal insolvency being a critical challenge to global financial stability (Meier et al. 2021). An examination of the proportional contributions of industrialized and developing nations to global debt and GDP growth reveals marked disparities (Belmonte-Ureña et al., 2021), indicating that developing countries contribute more significantly to global GDP growth than to the growth in global public debt. Additionally, analyzing per capita debt offers insights into the scale and burden of public debt (Dombi & Dedák, 2019).

Empirical data from international organizations like the IMF, World Bank, and the Asian Development Bank (ADB) provide valuable insights into ASEAN countries' public debt scenarios. For instance, as per the IMF's April 2021 report, the total public debt to GDP ratios in ASEAN countries in 2020 varied significantly, with Brunei Darussalam at 64.5%, Indonesia at 38.5%, and Singapore at 111.9%, among others. Furthermore, ADB data 2019 indicates that a substantial portion of ASEAN countries' public debt is foreign, averaging around 45.8% of total public debt (ADB, 2021).

Economic stagnation can lead to a debt trap, where insufficient public administration resources necessitate reliance on internal and external credit, further exacerbating the state's financial obligations (García, 2018). Economic growth thus becomes crucial in managing public debt. As Maja and Ayano (2021) argue, while population growth and productivity are traditional growth engines, future global economic growth will rely more on productivity gains, given the declining population growth rate. This perspective aligns with economist Robert Solow's view on the secular stagnation of advanced economies, which refers to the underutilization of economic growth potential (Popović, 2018). Factors such as an ageing population, lower birth rates contributing to reduced work hours, and low investment in physical capital are also reasons for sluggish economic growth (Johnson & Lichter, 2019; Majeed & Ayub, 2018).

The initial understanding of economic growth, which overlooked public debt, did not acknowledge its role in explaining economic stagnation (Matandare & Tito, 2018). However, modern governmental policies aimed at stimulating economic growth—such as extending working hours, improving worker quality, increasing investment, reducing regulatory burdens, and enhancing public and private R&D spending—implicitly recognize the impact of debt on economic stagnation (Croitoru, 2018).

In examining the growth rates of developed economies, which lag behind global growth, and emerging markets that slightly exceed world output levels, it becomes evident that the dynamics of debt, particularly post-crisis, play a crucial role (Anton & Nucu, 2020). The challenges posed by heavy debt burdens and high unemployment continue to dampen recovery prospects and future economic growth (Alessandria et al., 2020). The global investment landscape has been lacklustre, contributing to subpar global growth. This situation is further complicated by the varying economic trajectories and recovery paces across different countries and regions (Ahmad et al., 2020).

Understanding the stagnation or underdevelopment of economies requires an analysis of societal organization efficiency, where the role of institutions and political regimes in facilitating this process is pivotal (George et al., 2021). Few nations have successfully established efficient political and economic institutions, leading to prosperity. The absence of such institutions is not merely a result of cultural factors or ignorance. Still, it is rooted in politics, where ruling elites prioritize their interests over creating prosperity-promoting institutions (De la Porte & Jensen, 2021).

A country's economic success is closely linked to its economic institutions – the rules governing the economy and the incentives for economic agents (Canh et al., 2021). Effective economic institutions facilitate market efficiency, technology adoption, productivity, and prosperity. These institutions should ensure private property security and provide an impartial legal system and public services to foster fair exchange and competition (Bradley et al., 2021). Conversely, political institutions, shaped by power dynamics, can either effectively distribute and limit power or be detrimental if they concentrate power arbitrarily. Effective political institutions involve a broad coalition or various groups sharing power, unlike ineffective ones, where power is concentrated in the hands of a few (Tilome et al., 2020).

By impeding economic growth, debt fails to generate the necessary income to alleviate debt burdens, thus creating a cycle of increasing debt and sluggish growth. (Prabowo, et al. 2021). In financial transactions, unlike simple commercial exchanges, the debtor-creditor relationship extends into the future, often perpetuating financial dependency (Beretta & Cencini, 2020; Egger et al., 2020). This dependency is further reinforced through generations, with international political and economic organizations upholding these debt agreements (Oksanen et al., 2018).

Therefore, the theory of political regimes and institutions as determinants of economic growth provides a framework to understand why some governments establish and maintain institutions primarily focused on fulfilling public debt and financial commitments, often without questioning their legality or exploring alternative solutions to ease financial constraints (Urbano et al., 2019).

In many highly indebted countries, the focus of political and economic elites on maintaining power and enriching themselves leads to poor social organization. Creating economic institutions for fair distribution and efficiency is often not the primary objective. Political systems in these nations typically consolidate power in the hands of a few, with little restriction on its use, allowing those in power to shape economic institutions to their advantage, often to the detriment of societal welfare (Acemoglu &

Robinson, 2019).

As such, it becomes evident that there is no universal economic or financial panacea for the issue of public debt. Economic growth alone has proven insufficient to respond to the debt challenge, while restructuring and other financial interventions have, paradoxically, often exacerbated the problem. The diversity of each country's economic and financial context, characterized by unique governance regimes, historical trajectories, philosophies, and cultural nuances, precludes a one-size-fits-all solution for growth promotion and debt reduction. Some radical proposals face political impracticality, such as partial or total repudiation of external and internal debts, to free up financial resources for growth. Notably, domestic debt often resides with influential political figures within debtor countries, forming a substantial obstacle to debt denial (Bulmer, 2022).

A transformative approach involves establishing a government committed to reforming political and economic institutions. Such a government would focus on growth, public debt reduction, employment, equitable income distribution, and safeguarding strategic resources, aligning closely with public interests and timely financial obligations. However, this option is generally unpalatable to the ruling elite, dependent on the political status quo (Brand-Correa et al., 2022). While democratic regimes can foster efficient political institutions, leading to economic institutions that promote growth, democracy alone does not guarantee favourable economic outcomes without effective economic regulation and control mechanisms (Bjørnskov & Rode, 2020).

Thus, debt emerges as a predominantly political challenge, necessitating political solutions capable of disrupting the cycle of escalating debt and slowing economic growth. A social movement aimed at reforming political institutions to establish economic-financial institutions focused on debt, growth, and development could prove transformative despite likely facing staunch opposition from those who benefit from the current debt and economic stagnation (Song & Zhou, 2020).

In international relations, the interplay of foreign policies significantly influences the success of international cooperation, including trade agreements. This is exemplified by the impact of cooperation between countries on their economic relationships, as seen in the ASEAN economic cooperation in Southeast Asia (Lee & Oh, 2020).

While public debt undeniably affects economic growth and government policy, research findings on this impact remain mixed. For instance, Mhlaba & Phiri (2019) concluded that public debt does not significantly influence economic growth. Consequently, this study seeks empirical support for its hypotheses by analyzing statistical data on debt, growth, and other economic indicators. This involves an examination of global inequality, low growth rates, and a detailed assessment of key indicators for the Southeast Asian region. Supported by statistical information and the theoretical framework presented, this study employs a vector method to analyze panel data on public debt, economic growth, interest rates, consumption, and net exports in Southeast Asia from 1990 to 2020, thereby contributing to the broader discourse on managing public debt and fostering economic growth.

METHODS

This study employs a quantitative approach, utilizing secondary data from the World Bank from 1990-2020. The central methodology is vector analysis, applied through a panel vector model. This model is instrumental in exploring the causal relationships among key economic variables: public debt, interest rates, economic growth, domestic consumption, government spending, and net exports. The panel vector

equations employed in this research are structured as follows:

$$GDP_{ti} = \beta_0 + \beta_1 C_{ti1} + \beta_2 G_{ti2} + \beta_3 Nx_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \ldots\ldots(1)$$

$$C_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 G_{ti2} + \beta_3 Nx_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \ldots\ldots(2)$$

$$G_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 Nx_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \ldots\ldots(3)$$

$$Nx_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 D_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \ldots\ldots(4)$$

$$D_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 Nx_{ti4} + \beta_5 Ir_{ti5} + e_{ti} \quad \ldots\ldots(5)$$

$$Ir_{ti} = \beta_0 + \beta_1 GDP_{ti1} + \beta_2 C_{ti2} + \beta_3 G_{ti3} + \beta_4 Nx_{ti4} + \beta_5 D_{ti5} + e_{ti} \quad \ldots\ldots(6)$$

In these equations, GDP is Gross Domestic Product, C represents Consumption, Nx denotes Total Exports, D signifies Government Debt, Ir indicates the Interest Rate, t is the time period, i refers to the country under study, and e is the error term.

The data encompasses 10 ASEAN Member States, focusing on these key variables. Each variable's role and interaction are critical to understanding the broader economic dynamics within the region.

Table 1. Variable description

Variable	Explanation	Data type
Gross domestic product	The total market value of a nation's goods and services within a specific time frame.	Per cent
Consumption	Refers to consumer spending on goods and services. It is a primary component in calculating a country's GDP, measured as total consumer expenditure.	Per cent
Total export	Represents the value of all goods and services provided to other countries, excluding transfer payments, investment income, and employee compensation.	Per cent
Government debt	The government borrows the sum from various sources. It finances government expenditures beyond revenues, like infrastructure or social programs.	Per cent
Interest rate	The charge for borrowing money is often linked with monetary policy. Central banks adjust interest rates to influence inflation and economic growth.	Per cent

Through this methodological framework, the study aims to provide a comprehensive analysis of the interconnectedness of these variables and their collective impact on the Southeast Asian economic landscape.

RESULTS AND DISCUSSION

The preliminary step in our analysis involved conducting stationarity and cointegration tests before estimating the panel vector. The stationarity of the time series data is crucial for ensuring the reliability and validity of the vector panel analysis (Table 2). To this end, we employed the Augmented Dickey-Fuller (ADF) test to determine the presence of unit roots in the data series, indicating their stationarity or non-stationarity.

The ADF test results present an insightful perspective on the nature of the variables used in the study, notably highlighting their stationarity at the first difference. These findings are significant for a few key reasons and greatly influence the direction of the subsequent analysis.

Initially, unit roots at the level for certain variables, specifically Debt, Government Spending, and Net Export, indicate non-stationary behaviours in their original forms. This non-stationarity often manifests as trends or other evolving patterns, potentially distorting the analysis if not appropriately addressed. Recognizing

these characteristics is crucial in understanding the underlying nature of these economic indicators.

Table 2: ADF's Unit Root Test on DE, IR, GX, CO, NX, and GDP in Panel Data

Variable	Unit Root	Include in the examination Equation	The ADF Test stat.	5% Critical Value	Description
Debt (DE)	Level	Intercept	16.7096	0.1019	
	First Diff	Intercept	22.586	0.0000	Stationer
Interest Rate (IR)	Level	Intercept	6.8216	0.0000	Stationer
Government	Level	Intercept	12.3865	0.0813	
Spending (GX)	First Diff	Intercept	225.811	0.0000	Stationer
Consumption (CO)	Level	Intercept	92.1673	0.0000	Stationer
Net Export (NX)	Level	Intercept	9.1839	0.0912	
	First Diff	Intercept	21.1131	0.0000	Stationer
GDP	Level	Intercept	87.1131	0.0000	Stationer

Importantly, the transition of these variables to stationarity at their first difference is critical to the analysis. This change implies that the first differenced values of these variables maintain a constant mean and variance over time, a fundamental requirement for accurate and reliable econometric modelling. Stationarity at the first difference ensures that the variables can be used in subsequent time series analyses without the risk of misleading results caused by non-stationary data.

Consequently, the discovery that all variables attain stationarity at the first difference steers the analysis towards utilizing these differenced values in the vector analysis. Employing the first differences of the variables mitigates the risk of analyzing spurious relationships effectively, ensuring that the relationships explored and conclusions drawn reflect genuine economic dynamics rather than artefacts of non-stationary data.

The results from the cointegration test presented in Table 3 are pivotal for advancing the vector analysis in this study. Cointegration tests determine whether a set of non-stationary series are cointegrated, indicating a long-term equilibrium relationship despite being individually integrated at different orders.

Table 3. Cointegration test on DE, IR, GX, CO, NX, and GDP in panel data

Hypothesized	Fisher Stat.*		Fisher Stat.*	
(CE)	(trace test)	Probability	(max-eigen test)	Probability
None	117.2	0.0000	162.0	0.0000
At most 1	213.0	0.0000	145.1	0.0000
At most 2	82.19	0.0000	56.29	0.0000
At most 3	31.11	0.0541	29.16	0.0678
At most 4	15.83	0.0621	8.11	0.1744
At most 5	16.23	0.0769	16.21	0.1609
	Trace Test		Max-Eign Test	
Cross Section	Stat.	Probability**	Stat.	Probability**
Hypothesis of no cointegration				
1	221.4218	0.0000	71.1821	0.0000
2	166.7619	0.0000	72.9223	0.0000
3	115.9204	0.0099	43.5115	0.0263
4	156.1524	0.0000	47.0084	0.0009
5	124.5631	0.0019	42.1036	0.0316
6	176.7543	0.0000	62.3429	0.0001
7	211.4673	0.0000	91.4312	0.0000
8	196.3218	0.0000	72.7025	0.0000
9	126.8332	0.0000	52.5123	0.0022

10	121.1264	0.0001	49.1642	0.0051
Hypothesis of at most 1 cointegration				
1	126.1085	0.0000	69.3212	0.0000
2	111.6422	0.0000	61.3251	0.0000
3	79.3672	0.0781	26.1815	0.0711
4	96.7239	0.0002	47.1562	0.0016
5	87.1431	0.0267	29.1357	0.0972
6	112.1917	0.0000	44.1426	0.0069
7	129.1241	0.0000	76.9231	0.0000
8	111.1312	0.0000	51.0131	0.0007
9	99.5129	0.0021	41.1413	0.0096
10	93.1314	0.0092	29.1682	0.0912
Hypothesis of at most 2				
1	84.7275	0.0002	46.1775	0.0002
2	59.1815	0.0843	29.0239	0.0771
3	42.1723	0.1421	21.2083	0.0811
4	61.8765	0.0624	22.2143	0.0911
5	52.1632	0.0931	21.4321	0.0711
6	79.4321	0.0011	41.9143	0.0012
7	69.4211	0.0073	22.9214	0.0961
8	68.4327	0.0072	32.1629	0.0031
9	54.1234	0.0918	25.3254	0.0913
10	61.1523	0.0613	25.1855	0.0976
Hypothesis of at most 3				
1	31.2142	0.0965	19.8315	0.0922
2	29.1521	0.0921	16.1233	0.0816
3	20.1358	0.8243	8.1364	0.0911
4	35.9321	0.0762	16.2314	0.0623
5	29.1546	0.0614	12.3124	0.0914
6	36.7241	0.0632	16.1421	0.0651
7	42.3141	0.0213	22.0134	0.0621
8	31.1432	0.0769	11.1424	0.0922
9	31.1432	0.0711	12.4321	0.0721
10	29.1351	0.0743	21.1234	0.0612
Hypothesis of at most 4				
1	16.3134	0.0819	9.11790	0.0921
2	11.5912	0.0885	6.8139	0.0591
3	11.7323	0.0939	6.7123	0.0822
4	16.2313	0.0939	9.1532	0.0593
5	14.1325	0.0549	8.1224	0.0692
6	17.2332	0.0834	12.8321	0.0731
7	14.2163	0.0913	10.0712	0.0612
8	16.6531	0.0948	10.3218	0.0631
9	14.3125	0.0534	8.1416	0.0794
10	9.2416	0.0959	6.1128	0.0941
Hypothesis of at most 5				
1	7.1332	0.0972	7.1331	0.0972
2	5.9281	0.0583	5.1237	0.0583
3	5.1321	0.0594	5.9231	0.0594
4	6.1542	0.0826	6.1321	0.0842
5	5.1421	0.0923	5.6417	0.0923
6	4.9321	0.0603	4.7212	0.0603
7	8.0211	0.0782	8.1327	0.0781
8	6.3272	0.0671	6.3212	0.0672
9	7.2323	0.0501	7.0423	0.0509
10	2.8159	0.0788	2.6329	0.0878

The cointegration test results, as displayed in the table with Fisher Statistics for both the trace test and the maximum eigenvalue test, provide valuable insights into the relationships among the variables in the study. These tests examine hypotheses ranging

from 'none' to 'at most 5' cointegrations, offering a deep dive into the long-term interactions among the variables.

A critical observation from these results is the presence of cointegration among the variables. The probability values of 0.0000 for the initial hypotheses ('None' and 'At most 1') are notably less than the alpha level of 5%. This significant statistic leads to the rejection of the null hypothesis of no cointegration, indicating that the variables in the model – Debt (DE), Interest Rate (IR), Government Spending (GX), Consumption (CO), Net Export (NX), and GDP – are indeed cointegrated. This finding is essential as it suggests a long-term equilibrium relationship binding these variables. While individual data series may show non-stationary characteristics, the results indicate that they move together over the long term, implying a certain degree of interdependence and interaction that defines the economic dynamics of the region.

Moreover, cointegration implies that any short-term deviations from this long-term equilibrium will be self-correcting. This means the variables will adjust to return to the equilibrium relationship over time. This aspect of the results is particularly important for economic policy formulation, as it assures that the fundamental economic relationships among these key variables remain stable in the long run despite short-term fluctuations.

The significance of these results lies in their implications for subsequent analysis using a Panel Vector Error Correction Model (PVECM). The PVECM is an apt model for this scenario as it captures the short-term dynamics and the long-term equilibrium relationship among the cointegrated variables. Utilizing this model, we can comprehensively understand how each variable adjusts in the short term to align with the long-term equilibrium. This analysis is crucial in providing a holistic view of the economic dynamics within the ASEAN region, which is vital for informed policy-making and strategic economic planning.

The analysis utilizing the Panel Vector Error Correction Model (PVECM), as detailed in Table 4, offers a profound understanding of the economic dynamics within the Southeast Asian region. This robust econometric tool effectively dissects short-term and long-term relationships between key economic variables, revealing a complex web of interactions crucial for informed policy-making.

Table 4. PVECM on DE, IR, GX, CO, NX, and GDP in Panel Data

Cointegrating Eq:	CointEq1
DE(-1)	0.90000
IR(-1)	-0.21761
	(0.82142)
	[-0.25912]
GX(-1)	-6.87531
	(3.94212)
	[-1.62231]
CO(-1)	43.61821
	(6.12172)
	[7.31429]
NX(-1)	-0.12131
	(0.31541)
	[-0.53114]
GDP(-1)	-53.41242
	(3.44139)
	[-11.54212]
C	112.1243

Error Correction:	D(DE)	D(IR)	D(GX)	D(CO)	D(NX)	D(GDP)
CointEq1	0.001187	0.002921	-0.000134	-0.001312	-0.001762	0.008772
	(0.00218)	(0.00232)	(0.00027)	(0.00131)	(0.00172)	(0.00119)
	[0.06791]	[1.12342]	[-0.06972]	[-1.00121]	[-1.00211]	[1.27042]
D(DE(-1))	-0.09157	-0.14652	-0.04189	-0.04205	-0.02621	-0.00172
	(0.06102)	(0.05262)	(0.00851)	(0.02936)	(0.06178)	(0.02417)
	[-1.31351]	[-2.61316]	[-3.77421]	[-1.32316]	[-0.56147]	[-0.21827]
D(IR(-1))	0.005416	-0.16775	0.00268	0.02867	-0.03223	0.05765
	(0.06019)	(0.05274)	(0.00879)	(0.03221)	(0.06364)	(0.01712)
	[0.06854]	[-3.15882]	[0.12173]	[0.73341]	[-0.31431]	[2.04171]
D(GX(-1))	2.01174	-0.23750	0.02927	-0.22903	-1.64337	-0.22518
	(0.43184)	(0.36131)	(0.05711)	(0.22341)	(0.44012)	(0.16451)
	[4.42342]	[-0.83721]	[0.46476]	[-1.0561]	[-3.82234]	[-1.16394]
D(CO(-1))	-0.16215	-0.14021	-0.04484	-0.52563	0.16891	-0.30941
	(0.16929)	(0.13213)	(0.01279)	(0.08257)	(0.16261)	(0.06653)
	[-0.84812]	[-1.20539]	[-1.85129]	[-6.46836]	[0.98546]	[-4.25655]
D(NX(-1))	0.02822	0.02867	0.03232	-0.01672	-0.11622	-0.03222
	(0.05341)	(0.04546)	(0.00712)	(0.01514)	(0.04162)	(0.02139)
	[0.46742]	[0.44961]	[3.94742]	[-0.51458]	[-1.91774]	[-1.41953]
D(GDP(-1))	0.21969	0.10266	0.01644	0.12695	-0.46224	0.06353
	(0.17422)	(0.12941)	(0.02366)	(0.07321)	(0.16751)	(0.07103)
	[1.25479]	[0.67771]	[0.65251]	[1.48623]	[-2.70613]	[0.86667]
C	0.62497	-0.24927	-0.00338	0.11712	1.37242	0.36248
	(0.61236)	(0.51228)	(0.08712)	(0.28542)	(0.58259)	(0.24178)
	[1.00262]	[-0.47366]	[-0.00281]	[0.38721]	[2.33278]	[1.43663]

One of the most significant revelations from this analysis is the impact of state debt. The results indicate a substantial negative effect of state debt on nearly all the studied variables, suggesting that rising state debt could substantially hinder various economic indicators, potentially stalling economic growth and stability. This finding is particularly alarming as it highlights the challenges that increasing state indebtedness poses for the region's economic health.

Interest rates, another critical component of the economic framework, exhibit a dual effect. On one hand, they positively influence most variables, suggesting that higher interest rates might stimulate certain economic sectors. On the other hand, a negative relationship between net exports and the interest rate emerges, indicating a potential dampening effect on the export sector. This could be attributed to the increased borrowing costs and the consequent decrease in international market competitiveness, an essential consideration for economies reliant on exports.

Government spending, an essential tool for economic stimulus, negatively impacts all variables except for debt and government spending. This pattern implies a cyclical nature where increased government spending is driven by higher government debt, a cycle of spending financed through borrowing. This insight is crucial as it underscores the need for careful fiscal management and balancing government expenditures.

Consumption patterns within the region also play a pivotal role. The analysis shows that increased consumption negatively affects most variables except for net exports, indicating a boost in international trade due to heightened domestic consumption. This relationship is key in understanding regional trade dynamics, emphasizing domestic consumption's role as a critical driver of trade activities.

Additionally, GDP growth demonstrates a significantly positive impact across all variables, underscoring its vital role in enhancing Southeast Asia's monetary and real sectors. This positive influence across the board suggests a ripple effect of economic

growth, benefiting various aspects of the economy.

Lastly, the relationship of net exports with other variables, particularly its inverse correlation with interest rates and direct correlation with consumption, highlights the intricacies of trade dynamics in the region. These relationships indicate the complex interplay between domestic economic policies and international trade.

The Wald test results, as elucidated in Table 5, offer an enhanced perspective on the dynamics captured by the Panel Vector Error Correction Model (PVECM) in the study of Southeast Asian economies. The Wald test, a crucial statistical tool, assesses the significance of coefficients within a regression model, revealing critical insights about the interactions among various economic variables.

Table 5. Wald test on DE, IR, GX, CO, NX, and GDP in panel data

Test Stat.	Value	df	Prob.
Chi-square	23.61827	10	0.0048
H0: C(4)=C(5)=C(6)=C(7)=C(8)=C(9)=C(10)=C(11)=C(12)=C(13)=0			
H0 Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(4)		0.00548	0.06123
C(5)		0.03182	0.06874
C(6)		2.00295	0.44155
C(7)		-0.40773	0.43290
C(8)		-0.16315	0.17202
C(9)		0.19179	0.15846
C(10)		0.02522	0.05544
C(11)		-0.10600	0.05328
C(12)		0.21469	0.17893
C(13)		-0.29474	0.16176

A significant revelation from the Wald test is the chi-square value of 23.61827, with a probability of 0.0048. This probability, being markedly lower than the alpha level of 5%, underscores the statistical significance of the results. It indicates a meaningful short-term association between the variables within the PVECM model, suggesting that the model captures significant short-term adjustments. These adjustments are responses to deviations from a long-term equilibrium, highlighting how the variables dynamically interact over shorter periods.

Among the findings, the impact of government spending on public debt stands out. This aspect of the study resonates with the research by Baum et al. (2021), which emphasizes that government spending, particularly in vital sectors like health, can yield significant benefits for public health and welfare. However, this spending also can potentially escalate public debt, presenting a complex challenge for economic policymakers.

Furthermore, the study aligns with the work of Aksoy & Yilmaz (2019) and Mian & Sufi (2019). Aksoy & Yilmaz observed that government spending could spur economic growth and reduce unemployment in fiscally robust countries but may concurrently increase public debt. Similarly, Mian and Sufi highlighted that curtailing government spending could reduce public debt in high-interest rate contexts, but this could come at the cost of reduced economic growth.

These findings underscore the intricate balance policymakers must strike in managing government expenditure. While increased spending can positively impact public welfare and stimulate economic growth, its potential to raise public debt cannot be overlooked. Thus, it necessitates careful fiscal planning and management. Policymakers are tasked with maximizing the benefits of government spending while carefully managing and mitigating the risks associated with increasing public debt.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

A significant conclusion of the study is the pervasive impact of public or state debt, which appears to suppress almost all economic variables, pointing to a constraining effect on the Southeast Asian economy. This is further compounded by the influence of interest rates on net exports, indicating that rising interest rates might impede the exports of ASEAN member countries, likely due to increased borrowing costs impacting export competitiveness.

Another intriguing aspect revealed is the role of government spending, which, contrary to expectations, contributes to the escalation of public debt. This relationship highlights the complexities of fiscal management and its direct implications for a country's economic health. On a positive note, the study finds that domestic consumption within the region boosts exports through international trade agreements, underscoring the importance of internal demand in driving external trade.

Moreover, exports are shown to play a vital role in augmenting government revenues by increasing government spending. This underscores the significance of exports in the national economies of the ASEAN region. The study also highlights that economic growth, indicated by an increase in GDP, positively drives all studied variables, suggesting that GDP growth is instrumental in enhancing both the monetary and real sectors of the Southeast Asian economies.

Recommendations

Based on these insights, several recommendations emerge. Firstly, there is a call for ASEAN member countries to strengthen international trade cooperation, a key driver of economic growth. Additionally, in light of the impact of public debt, it is advised that governments exercise caution in accruing debt. Balancing short-term benefits against long-term economic pressures is crucial to mitigate the adverse impacts of debt on the economy.

Finally, recognizing the limitations in data availability and the scope of the research period, the study suggests future research directions. It is recommended that the effectiveness of public debt management and the factors driving economic growth, particularly concerning international trade relations within ASEAN, be further explored. Such research could provide a more comprehensive understanding of the economic growth factors in the region and strategies to reduce the negative impact of public debt and economic pressures.

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